IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:	Cherneff, et al.
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Group Art Unit:	3623
Examiner:	Johnna Stimpak
Title:	*System for Scheduling Product Planning*

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Willie Jiles
Willie Jiles

Date: December 13, 2004

Dear Sir:

Appeal Brief

Appellants have appealed to the Board of Patent Appeals and Interferences ("Board") from the decision of the Examiner mailed August 16, 2004, finally rejecting all pending Claims 1-45. Appellants filed a Notice of Appeal on October 13, 2004. Appellants respectfully submit this Appeal Brief with the statutory fee of $500.00.

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Real Party in Interest

This Application is currently owned by i2 Technologies US, Inc., as indicated by an Assignment recorded on November 13, 2001, from the inventors to i2 Technologies US, Inc., in the Assignment Records of the United States Patent and Trademark Office (the "PTO") at Reel 012300, Frames 0252-0256.

Related Appeals and Interferences

To the best of Appellants' knowledge, no known appeals, interferences, or judicial proceedings will directly affect, be directly affected by, or have a bearing on the Board's decision regarding this Appeal.

Status of Claims

Claims 1-45 are pending in this Application, stand rejected pursuant to a Final Office Action mailed June 16, 2004 (the "Final Office Action"), and are all presented for appeal. All pending claims are shown in Appendix A, along with an indication of the status of those claims.

Status of Amendments

All amendments submitted by Appellants have been entered by the Examiner.

Summary of Claimed Subject Matter

In certain embodiments, the present invention includes a system and method for scheduling development planning projects and for monitoring progress of those projects after they are initiated. The project scheduler may be part of an overall system that begins with initial selection of products to be developed. The selection process may generate an initial plan for its projects, which may then be used during the development process. At the planning level, resources may be allocated as an amount during a time period, which can be selected as one month, for example. During the execution phase, resources may be allocated by program managers at a finer granularity, on a daily basis for example. In certain embodiments, individuals who will be performing particular parts of the work may not be identified during the planning stage but may be identified during the execution stage. (*See* Page 7, Lines 1-10)

Figure 1 illustrates an example planning process generally at a high corporate level. The portfolio planner system resides on a server 10, which may be accessed directly or indirectly by the various people involved in the planning process. Those people include program managers and resource managers 12 who may access the server 10 through one or more web servers 14. Program managers and resource managers 12 access a login web page 16 that gives them access to the underlying web pages 18 used to manipulate data and access an underlying database 20. (*See* Page 7, Line 15 through Page 8, Line 2)

In certain embodiments, portfolio analysts 22 access the portfolio planner server 10 through various scenario building tools 24 not available to program and resource managers 12. A portfolio team 26 may make final decisions as to which products are to be developed and determines the various high level strategies to be implemented. They may be assisted in their decision making by the analysts 22. This division of work is merely an example; other high level relationships may be used with the present invention. (*See* Page 8, Lines 3-9)

Figure 2 illustrates example types of information used by the system to develop an optimum portfolio. Planning engine 28 accepts inputs and generates development plans as described below. Users 30 both provide initial inputs to planning engine 28 and assess generated results. Planning engine 28 may use various types of data as inputs and modifies data as the planning process proceeds. Data regarding projects 32 may be used to define

what steps are necessary to develop each new product under consideration. Data regarding the resources 34 available to develop new products is provided, as is information regarding the financial models 36 that project the impact on profits of developing each product by a set of introduction dates. (*See* Page 8, Lines 10-19)

In certain embodiments, forward looking financial models are incorporated into the development planning strategy, which may add to the usefulness of the present system. Because late product introduction can have such a devastating impact on the profit contribution made by a product over its lifetime, it is desirable to consider timing effects in order to develop a useful product development plan. The present system enables different profit projections to be provided for various new product introduction dates (as discussed with reference to Figure 6). (*See* Page 8, Line 20 through Page 9, Line 4)

Referring to Figure 3, each product under consideration for development may be developed by one or more alternate projects. For example, product A may be developed by a project X 40, which is currently selected as the active project for this product. In certain embodiments, only one development project is planned for any single product to prevent different development projects for a product from being pursued simultaneously. For example, portfolio planners can select alternate projects, such as project Y 42 or project Z 44, to assess the impact on overall profitability and scheduling of these alternate projects, but only one project is selected at a particular time. (*See* Page 9, Lines 8-15)

Referring to Figure 4, a project 46 may comprise a sequence of tasks. A simplified example sequence of tasks 48-58 is shown in Figure 4, which assumes that two components need to be developed to develop a new product. In many cases, many of the components in a new product can be reused from earlier products and integrating them is the primary concern. (*See* Page 9, Lines 16-20)

Tasks may be associated with constraints that are used to sequence the tasks for planning purposes. Some tasks must be completed before others, and a set of constraint rules is provided to enforce the proper ordering. Other tasks can be completed in parallel, with component development not depending on the development of some of the other product components. These relationships are expressed as a set of constraint rules for each project. The planning engine may enforce these constraints when scheduling development of

products. The constraints may be especially important when multiple products are being scheduled for concurrent development, which is the most common scenario in which the present system is used. (*See* Page 10, Lines 1-9)

Projects may be broken down into phases, which are collections of related tasks as defined by those using the system. Referring to Figure 5, a product A 60 is to be developed through project X 62, which in turn consists of tasks 64-72. These tasks are shown as being broken into 3 phases 74, 76, 78, which occur in sequential order. In a planning situation where it may be presumed in advance that not all development projects will proceed to completion, the use of project phases may enhance the accuracy of the portfolio projections. (*See* Page 10, Lines 10-16)

Each task may require certain resources. These resources may be defined as, for example, a certain number of person days to be made available during a specified time frame by a specified resource. Each resource may have a capacity, defined as the number of person days which are available in this example. This capacity may change over time and, in particular, may change depending upon the day of the week, the amount of overtime that can be worked, the impact of holidays, and so on. The process of scheduling projects generally involves scheduling tasks, which use up available resources. As schedules are developed, the available resources diminish. (*See* Page 10, Line 17 through Page 11, Line 2)

When a possibility that a project will not be completed exists, a probability of completion can be assigned in advance to each phase of the project. For example, it can be assumed that the initial phase 74 of the project is 100% likely to be performed. Whether product development continues will depend on the results of the first phase/ and a probability of 80% can be assigned, for example, to second phase 76. In this example, assume that the probability of executing the third phase 78 is 50%, once the second phase is completed. (*See* Page 11, Lines 3-9)

The resources that will be used by project 62 are multiplied by the appropriate probabilities when resource allocation is performed at the planning stage. Thus, the resources that would be needed by the second phase 76 are multiplied by *0.8* to take into account the lesser probability that they will be needed at all. For the third phase 78, the required resources are multiplied by $0.8 * 0.5 = 0.4$, because the third phase depends on both a

decision to be made after second phase 76 completion (*50%*) and the probability that the second phase will be performed (*80%*). The resources normally required for each phase are multiplied by the product of all preceding phase probabilities to reach a resource allocation multiplier for that phase for planning purposes. (*See* Page 11, Lines 10-19)

In certain embodiments, the present invention includes capabilities for financial modeling in the product development planning process. Expected profits over the lifetime of a product may be a function of the introduction date of the product, as well as numerous other factors. The present invention enables a series of financial projections be run in order to assist in the planning process. (*See* Page 20, Line 20 through Page 21, Line 4)

Figure 6 illustrates an example of the time element as it relates to the profit projections used in certain embodiments. An example graph 74 includes three profit curves 76, 78, 80 which are shifted in time to represent different product introduction dates. In this example, the peaks of the curves diminish for later product introduction dates. At some point, there may be only minimal profits if the product is introduced too late. The total profits over the lifetime of a product may be calculated by integrating under the separate profit curves. (*See* Page 12, Lines 5-11) Each possible product introduction date may have a corresponding overall profit figure. Some products may be relatively insensitive to the date of introduction and can be introduced an any suitable time. Other products are extremely time sensitive and must be developed as quickly as possible. The time impact on product contribution to corporate profits is used as part of the data considered in the optimization process. (*See* Page 12, Lines 12-17)

The portfolio planning process may include optimizing a set of inputs to maximize an output value. In an example system, the output to be maximized is the overall profit to be made by products to be developed. As shown in Figure 7, a planning engine 90 generates an output financial projection 92 that comprises the expected profit to be generated by a given product mix 94. Product mix 94 may be provided as an input to planning engine 90 and defines the products that are in the portfolio and available for consideration. Data defining available resources 96, project definitions 98, and time dependent financial projections 100 may be provided as well.

Resources 96 includes a list of all available resources needed to develop new products. Not all resources available to the company must be considered; only those that relate to new product development are of interest. Project definitions 98 are the list of tasks required to develop each possible product. The financial projections 100 may be as described above. Project definitions 98 and financial projections 100 may be provided separately for each possible product to be developed. Resources 96 may include all resources that are available. (*See* Page 13, Lines 5-12)

The planning process may begin when a possible portfolio of new products is provided as the product mix 94. Planning engine 90 may generate a schedule 104 for product development in the traditional manner, utilizing the sequence and timing constraints contained in the project definitions. Development projects may be scheduled utilizing available resources, and a dollar number for each of the various projects under consideration may be generated based upon introduction and completion dates. Part of the scheduling process is the selection of which products are to be developed; this list is preferably chosen to maximize overall projected profit. A user determines whether the financial result and plan is suitable, and may change the product mix if necessary. The planning process may be an open loop process, with the user changing the portfolio in order to determine the impact on overall profitability. (*See* Page 13, Line 13 through Page 14, Line 2)

The scheduling process may balance weighted interests to generate a best overall schedule according to the various inputs. The present system may use financial projections, which may differ depending on introduction date, as a weighted factor in the optimization process. Thus, products which lose significant profitability if they are introduced late are more likely to be scheduled for fastest introduction, while less time sensitive products may be scheduled later. Those products that contribute the most to profitability may have a priority in the scheduling process. (*See* Page 14, Lines 3-10)

In addition to the projected profit number 92, the present system may also generate a schedule to control the development process. This schedule may be used by project managers to determine deadlines, so that overall corporate schedules and profit targets can be met. The schedule 104 generated by planning engine 90 may be at a higher level than needed to implement the plan. Schedule 104 allocates resources by function, but does not performed

a detailed allocation. The detailed allocations are taken care of by a separate scheduler that accounts for resources at a more detailed level and accepts feedback regarding the progress of the various development projects selected with the planning engine 90. (*See* Page 14, Lines 15-20)

For example, during the planning stage, resources are preferably dealt with at a higher level than is needed for detailed scheduling. The same is true for scheduling of tasks; larger tasks may need to be broken down into subtasks at the scheduling level in order to effectively schedule resources and monitor progress. At the same time, financial considerations are not part of the detailed scheduling process, and so are not included once the portfolio mix has been determined. (*See* Page 15, Lines 1-6)

Figure 8 illustrates an example data flow for the development scheduler that corresponds to Figure 7 for the portfolio planner. Referring to Figure 8, one or more of schedule 104, resources 108, project definitions 110, and supply chain information 112 may be used input to scheduler 106. As described below, resources 108 and project definitions 110 may be similar to, but more detailed than, resources 96 and project definitions 98 used with the planning engine 90. Scheduler 106 may track actual progress of all projects 114 for the company, based upon input by users 116 who track tasks as they are completed. Scheduler 106 generates a detailed schedule 118 that can be used by people in the company to plan their development schedules. (*See* Page 15, Lines 7-17)

While the portfolio planner may be used primarily by strategic management, the development scheduler may be used primarily by project managers and resource managers. Figure 9 illustrates an example relationship between the various users and the scheduler. The scheduling system may be implemented on server 120, where it can be accessed by all users that need access. In this example, master planners 122 are the strategic managers responsible for selecting the product mix. Their responsibility may not cease once the portfolio has been defined, however, because schedules may need to change as a result of unplanned or unforeseen circumstances. In certain embodiments, master planners 122 are not involved in the day-to-day operation of the scheduler 120, but may become involved if a change is needed to the schedule. (*See* Page 15, Line 18 through Page 16, Line 6)

Project managers 124 may be a primary user of the scheduler. They maintain detailed information about their projects and define low-level changes that need to occur. If the master schedule calls for a project to complete two tasks during a particular month, it may be the project manager's task to ensure that the tasks are actually completed. A detailed schedule is generated by the scheduler and followed by the project team to the extent possible. The original schedule 104 generated by the planning engine 104 is broken down into the required level of detail by the scheduler. Project team members may use the scheduler to view their schedule and enter data showing actual progress made. As tasks are completed, this data may be entered into scheduler 50 so that progress can be confirmed as meeting the schedule. Details of the schedule may be changed depending on the actual progress made. Unless these changes will impact any deadlines set in the master schedule, approval may not be required from master planners 122. (*See* Page 16, Lines 7-20)

Resource planners 128 may use scheduler on server 120 to monitor and update the status of the resources for which they are responsible. If the capacity of a resource changes, this information may be entered into the scheduler. Loss of capacity may impact the ability to meet scheduled deadlines, which may raise a flag to project managers 124 and may require intervention by master planners 122. Resource planners may also be responsible for ensuring that required materials are available. Because some of the required materials are obtained from outside suppliers, resource planners 128 may use supply chain tools, such as those available from i2 Technologies, to track suppliers and ensure that all required materials are ready in time. If required materials will not be ready, the effect on the schedule may be the same as if a required resource would not be available. This may again necessitate a change to the schedule by master planners 122. Application administrators 130 may monitor functioning of the system and assist others in using it. They generally have no input regarding schedules. (*See* Page 16, Line 21 through Page 17, Line 12)

During the portfolio planning stage, tasks may be defined at a relatively high level. A task could be, for example, to test a product or a component of a product. This test might take a relatively long period of time, perhaps several weeks, and use several different resources. For detailed scheduling purposes, tasks may be broken down into smaller pieces in order for them to be more effectively scheduled. (*See* Pate 17, Lines 13-18)

Figure 10 illustrates an example task broken down into subtasks. In this example, task 140 is a test set and comes sequentially before task 142. This may be a sufficient level of detail for planning purposes, but is presumed for this example to be insufficient in detail for scheduling purposes. Task 140 includes three subtasks 144, 146, 148 that are performed in sequential order, although the present invention contemplates subtasks being concurrent, if appropriate. Sequential tasks may be defined by constraints associated with the task, which require certain tasks to be completed before others begin. Subtasks may be broken into smaller subtasks, as shown. For example, subtask 144 has two subtasks 150, 152, which may be performed either sequentially or concurrently. (*See* Page 17, Line 19 through Page 18, Line 8)

Each leaf subtask on a task hierarchy tree, subtasks 150, 152, 146, and 148 in Figure 10 for example, is associated with one or more resources. The resources needed for task 140 may be the sum of all resources needed for the subtasks of task 140. Because standard tasks may comprise a fairly complex set of subtasks, they may be pre-stored as templates to be used whenever the standard task is required. This may simplify the planning and scheduling process because the details of each task are generated once and may be reused many times. The high-level time and resources required for a task may be used by the portfolio planner; and the details contained in the subtasks may be used by the detailed scheduler. (*See* Page 18, Lines 9-17)

As illustrated in Figure 11, resources also may be defined in a hierarchy. In this example, resource A 160 includes three separate sub-resources 162, 164, and 166. Resources 162 are further broken into a lower level of resources, resources 168 and 170. The resource hierarchies may be defined to match resources as they are actually applied within the company. At the lowest sub-level, a resource could comprise a single person or a group that works as a unit. For example, resource 160 could be defined as the testing department, with resource 162 being the user interface group and resources 168 and 170 being testing teams or individuals. The lowest levels of subtasks 150, 152 may be resources at the lowest, detailed levels. (*See* Page 18, Line 18 through Page 19, Line 7)

At the portfolio planning level, resource 160 may be used in the aggregate by defining a number of testing days available during a month and being allocated on that basis, for

example. During detailed scheduling, the testing teams to be used may be identified when the project is scheduled. The hierarchical definition of tasks and resources described herein may allow higher level plans to be easily allocated to lower level tasks and resources. Depending on the nature of specific tasks and resources, lower levels may have to be used even during portfolio planning. However, in many instances this will not be necessary, and the details can be hidden by layers of hierarchical levels. (*See* Page 19, Lines 8-16)

In certain embodiments, the scheduler may operate as follows. High level schedule 104 may be provided and scheduled in the normal manner for a relatively short future time period. For example, if the planning schedule is determined in months and the detailed schedule operates in units of days, a detailed scheduling window might extend only 3 months into the future. After that time, high level tasks are scheduled using high level resources in accordance with the master plan. In this example, lower levels of tasks and resources are only scheduled during the detailed scheduling window. (*See* Page 19, Line 17 through Page 20, Line 2)

Figure 12 illustrates example information used to define each resource 180. Each resource 180 may have a capacity 182, defined as the number of hours that the resource can work in a day for example. Each resource 180 also may have an availability 184, which is a calendar of when the resource is available for example. Assuming the resource to be a single person, for example, vacation schedules, holidays, and other calendar information may be provided. In this example, availability modifies the capacity values described with relation to box 182. Each resource may also have an ability 186, which identifies the type of work that can be performed by the resource. Ability may be broken down into attributes 190, which describes the types of work that can be performed by the resource, and competency 188, which describes how well the resource can do the job. A resource 180 may have several different attributes, if desired and appropriate, and corresponding competencies for each attribute. These abilities may be used to match tasks with appropriate resources. (*See* Page 20, Lines 3-18)

As illustrated in Figure 13, tasks may also have a definition. In this example, task 200 is assigned a type, which is generally defined to be a work task. Work tasks may have one or more resource requirements. A task may also be given a type of milestone, which is simply a

placeholder used for management purposes to indicate that a project milestone has been reached. In certain embodiments, milestone tasks have neither resource requirements nor a duration. Hierarchy relationship 204 may store pointers for related tasks. The hierarchy relationships among tasks may define the task hierarchies described previously. Precedence relationships between tasks (i.e., the sequencing between tasks) may also be defined in hierarchy relationship 204. Duration 206 may be a time that the task will take to complete. When a task is scheduled, the user may specify the resources needed and the duration. Preferably, an additional time buffer is specified to identify an additional allowed amount of duration in which the task can be completed. Resources 208 are assigned to tasks. A task may require more than one resource, but a single resource is usually needed for a single task. In certain embodiments, resource requirements are associated with tasks that do not have subtasks, and the resources for a task having subtasks are defined to be those of its children. (*See* Page 20, Line 19 through Page 21, Line 14)

Several different aspects of resources may be defined, including one or more of choice 210, amount of work 212, and ability 214. Choice 210 may specify the resource to be used. Choice 210 may be a top level selection, in which case the scheduler is free to select any appropriate sub-resource to accomplish the task. In some cases, the individual resource may be specified, in which case that particular resource will be used. Amount of work 212 includes both duration (e.g., days) and load (i.e., expressed as the capacity, in hours-per-day for example, that the resource requirement uses). Ability 214 may include a requirement for a minimum competency or experience level for the resource. If a higher competency resource is used for the task, the duration may be shortened by an amount proportional to the skill differential. (*See* Page 15, Lines 15-22)

Progress 216 may include the actual date the task was started, the completion date if it has been completed, and the estimated remaining duration if the task has been started but not yet completed. This information may be updated by project team members as tasks are performed. (*See* Page 16, Lines 6-9)

Scheduling requirements 218 may include one or more of policies 220 and constraints 222. Policies 220 may indicate how constraints should be enforced (e.g., flags indicating whether additional duration can be used and whether certain constraints are to be enforced).

Constraints 222 may point to the constraints to be used in scheduling this task. Constraints 222 may be of several types. Some constraints may be built into the scheduler (e.g., a resource cannot be used simultaneously by two resources, precedence relations will be enforced, and tasks that require material resources are not scheduled until the materials are available). Others constraints may be controlled by users and can be changed as part of the modeling process to study alternative scenarios (e.g., fixed start and completion dates, allowable delays between sequential tasks, whether or not overtime is allowed to complete a task, and penalties for differences in location for resources used in the same task or project). (*See* Page 22, Line 10 through Page 23, Line 2)

In certain embodiments, once all of the described information is completely specified, the system may use genetic algorithms to determine optimum schedules that meet all of the constraints. By changing task and resource constraints and specifying certain resources and task dates, a schedule may be generated that meets all of the goals originally set in the portfolio plan and is attainable by the resources available. Because of the fast computational nature of genetic algorithm programs, numerous what-if scenarios can be computed in a reasonable time. (*See* Page 23, Lines 3-9)

Grounds of Rejection to be Reviewed on Appeal

Are Claims 1-45 patentable over U.S. Patent 6,571,215 to Mahapatro ("*Mahapatro*") in view of U.S. Patent 5,548,518 to Dietrich, et al. ("*Dietrich*") and U.S. Patent 5,408,663 to Miller ("*Miller*") under 35 U.S.C. § 103(a)?

Grouping of Claims

Appellants have made an effort to group claims to reduce the burden on the Board. In the Argument section of this Appeal Brief, where appropriate, Appellants present arguments as to why particular claims subject to a ground of rejection are separately patentable from other claims subject to the same ground of rejection. To reduce the number of groups and thereby reduce the burden on the Board, Appellants do not argue individually every claim that recites patentable distinctions over the references cited by the Examiner, particularly in light of the clear allowability of Appellants' independent claims.

Appellants have concluded that the claims may be grouped together as follows for purposes of this Appeal:

1. Group 1 may include independent Claims 1, 3, and 31 and dependent Claims 2, 4-7, 11-12, 15-20, 24-25, 28-30, 32-35, 39-40, and 43-45;
2. Group 2 may include Claims 8, 21, and 36;
3. Group 3 may include Claims 9, 22, and 37;
4. Group 4 may include Claims 10, 23, and 38;
5. Group 5 may include Claims 13, 26, and 41; and
6. Group 6 may include Claims 14, 27, and 42.

Argument

The rejection of Claims 1-45 under 35 U.S.C. § 103(a) as being unpatentable over the proposed *Mahapatro-Dietrich-Miller* combination is improper and should be reversed by the Board.

I. Overview

Claims 1-45 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over the Examiner's proposed *Mahapatro-Dietrich-Miller* combination. A copy of *Mahapatro* is attached as Appendix B, a copy of *Dietrich* is attached as Appendix C, and a copy of *Miller* is attached as Appendix D. Appellants respectfully submit that the Examiner's proposed *Mahapatro-Dietrich-Miller* combination fails to support the obviousness rejections of Claims 1-45. Thus, Appellants respectfully submit that these rejections are improper and should be reversed by the Board.

II. Standard

The question raised under 35 U.S.C. § 103 is whether the prior art taken as a whole would suggest the claimed invention taken as a whole to one of ordinary skill in the art at the time of the invention. *See* 35 U.S.C. § 103 (a). Accordingly, even if all elements of a claim are disclosed in various prior art references, which is certainly not the case here as discussed below, the claimed invention taken as a whole cannot be said to be obvious without some reason given in the prior art why one of ordinary skill at the time of the invention would have been prompted to modify the teachings of a reference or combine the teachings of multiple references to arrive at the claimed invention.

The M.P.E.P. sets forth the strict legal standard for establishing a *prima facie* case of obviousness based on modification or combination of prior art references. "To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references where combined) must teach or suggest all the claim limitations." M.P.E.P. § 2142, 2143. The teaching, suggestion, or motivation for the modification or

combination and the reasonable expectation of success must both be found in the prior art and cannot be based on an applicant's disclosure. *See Id.* (citations omitted). "Obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either explicitly or implicitly in the references themselves or in the knowledge generally available to one of ordinary skill in the art" at the time of the invention. M.P.E.P. § 2143.01. Even the fact that references *can* be modified or combined does not render the resultant modification or combination obvious unless the prior art teaches or suggests the desirability of the modification or combination. *See Id.* (citations omitted). Moreover, "To establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. All words in a claim must be considered in judging the patentability of that claim against the prior art." M.P.E.P. § 2143.03 (citations omitted).

The governing Federal Circuit case law makes this strict legal standard even more clear.[1] According to the Federal Circuit, "a showing of a suggestion, teaching, or motivation to combine or modify prior art references is an essential component of an obviousness holding." *In re Sang-Su Lee,* 277 F.3d 1338, 1343, 61 U.S.P.Q.2d 1430, 1433 (Fed. Cir. 2002) (quoting *Brown & Williamson Tobacco Corp. v. Philip Morris Inc.,* 229 F.3d 1120, 1124-25, 56 U.S.P.Q.2d 1456, 1459 (Fed. Cir. 2000)). "Evidence of a suggestion, teaching, or motivation. . . may flow from the prior art references themselves, the knowledge of one of ordinary skill in the art, or, in some cases, the nature of the problem to be solved." *In re Dembiczak,* 175 F.3d 994, 999, 50 U.S.P.Q.2d 1614, 1617 (Fed. Cir. 1999). However, the "range of sources available. . . does not diminish the requirement for actual evidence." *Id.* Although a prior art device "may be capable of being modified to run the way the apparatus is claimed, there must be a suggestion or motivation in the reference to do so." *In re Mills,* 916 F.2d at 682, 16 U.S.P.Q.2d at 1432. *See also In re Rouffet,* 149 F.3d 1350, 1357, 47 U.S.P.Q.2d 1453, 1457-58 (Fed. Cir. 1998) (holding a *prima facie* case of obviousness not made where the combination of the references taught every element of the claimed invention but did not provide a motivation to combine); *In Re Jones,* 958 F.2d 347,351,21 U.S.P.Q.2d 1941, 1944 (Fed. Cir. 1992) ("Conspicuously missing from this record is any evidence, other

[1] Note M.P.E.P. 2145 X.C. ("The Federal Circuit has produced a number of decisions overturning obviousness rejections due to a lack of suggestion in the prior art of the desirability of combining references.").

than the PTO's speculation (if that can be called evidence) that one of ordinary skill in the herbicidal art would have been motivated to make the modification of the prior art salts necessary to arrive at" the claimed invention.). Even a determination that it would have been obvious to one of ordinary skill in the art at the time of the invention to try the proposed modification or combination is not sufficient to establish a *prima facie* case of obviousness. *See In re Fine,* 837 F.2d 1071, 1075,5 U.S.P.Q.2d 1596, 1599 (Fed. Cir. 1988).

In addition, the M.P.E.P. and the Federal Circuit repeatedly warn against using an applicant's disclosure as a blueprint to reconstruct the claimed invention. For example, the M.P.E.P. states, "The tendency to resort to 'hindsight' based upon applicant's disclosure is often difficult to avoid due to the very nature of the examination process. However, impermissible hindsight must be avoided and the legal conclusion must be reached on the basis of the facts gleaned from the prior art." M.P.E.P. § 2142. The governing Federal Circuit cases are equally clear. "A critical step in analyzing the patentability of claims pursuant to [35 U.S.C. § 103] is casting the mind back to the time of invention, to consider the thinking of one of ordinary skill in the art, guided only by the prior art references and the then-accepted wisdom in the field. . . . Close adherence to this methodology is especially important in cases where the very ease with which the invention can be understood may prompt one 'to fall victim to the insidious effect of a hindsight syndrome wherein that which only the invention taught is used against its teacher.'" *In re Kotzab,* 217 F.3d 1365, 1369, 55 U.S.P.Q.2d 1313, 1316 (Fed. Cir. 2000) (citations omitted). In *In re Kotzab,* the Federal Circuit noted that to prevent the use of hindsight based on the invention to defeat patentability of the invention, the court requires the Examiner to show a sufficient motivation in the prior art to combine the references that allegedly create the case of obviousness. *See id. See also, e.g., Grain Processing Corp. v. American Maize-Products,* 840 F.2d 902,907,5 U.S.P.Q.2d 1788, 1792 (Fed. Cir. 1988). Similarly, in *In re Dembiczak,* the Federal Circuit reversed a finding of obviousness by the Board, explaining that the required evidence of such a teaching, suggestion, or motivation is essential to avoid impermissible hindsight reconstruction of an applicant's invention:

> Our case law makes clear that the best defense against the subtle but powerful attraction of hind-sight obviousness analysis is *rigorous application of the requirement for a showing of the teaching or motivation to combine prior art*

> *references.* Combining prior art references without evidence of such a suggestion, teaching, or motivation simply takes the inventor's disclosure as a blueprint for piecing together the prior art to defeat patentability-the essence of hindsight.

175 F.3d at 999,50 U.S.P.Q.2d at 1617 (emphasis added) (citations omitted).

III. *Mahapatro*

Mahapatro is directed to a system for generating a schedule by generating assignments for the tasks of a project and sequentially scheduling the individual assignments to available resources. (Abstract) The system disclosed in *Mahapatro* receives information concerning the resources and the tasks. (Column 5, Lines 15-16) The tasks may be associated with constraints such as an identification of the resources assigned to the task and scheduling constraints (e.g., the date by which the task must be completed). (*See* Abstract and Column 6, Lines 33-40) The information concerning the resources and tasks is used to generate assignments, which can be individually scheduled to a resource, and a resource calendar that identifies available time slots for each resource. (Column 5, Lines 16-20) Next, the assignments are sequentially scheduled into available time slots for the various resources assigned to the project. (Column 5, Lines 20-22) According to *Mahapatro,* the resulting schedule is balanced and maximizes the utilization of the available resources. (Column 5, Lines 22-23)

IV. *Dietrich*

Dietrich discloses an allocation method for generating a production schedule. According to *Dietrich,* the method, in response to a specified requirement *q,* comprises the steps of determining what quantity (*r*) of a product can be produced with a specified quantity of supply components; allocating a required quantity of supply components for fulfilling a thus defined partial order; and filling a remainder of the requirement (*q-r*) at some later time. (Abstract)

V. *Miller*

Miller discloses methods of operating a digital computer to optimize project scheduling. According to *Miller,* where the overall effects of a schedule, such as total project

duration or cost, are unsatisfactory, the schedule is processed iteratively so that on each iteration a particular task is selected for modification according to a preset policy and data defining an aspect of that task is adjusted in a small step. (Abstract) A schedule is further optimized to fit the available resources by a repetitive process of assigning resources having the proper capabilities to tasks according to a predetermined order of tasks and testing whether the assigned resource can permit shortening of the task duration. (Abstract) Further methods select an optimum mix of capabilities to be provided by each of several resources to be hired for a project. (Abstract)

VI. Group 1 (Claims 1-7, 11-12, 15-20, 24-25, 28-35, 39-40, 43-45)

Claims 1-7, 11-12, 15-20, 24-25, 28-35, 39-40, 43-45 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over the proposed *Mahapatro-Dietrich-Miller* combination. Appellants respectfully submit that these claims are clearly patentable over the proposed *Mahapatro-Dietrich-Miller* combination. Thus, Appellants respectfully submit that these rejections are improper and should be reversed by the Board.

Claims 1-7, 11-12, 15-20, 24-25, 28-35, 39-40, 43-45 are separately patentable from every other claim subject to the same ground of rejection. These claims recite limitations that are substantially different from limitations recited in other claims. In addition, claims excluded from Group 1 that are subject to the same ground of rejection and that depend on independent Claims 1, 3, and 31, respectively, recite patentable distinctions over the prior art beyond those recited in independent Claims 1, 3, and 31 and cannot be properly grouped with independent Claims 1, 3, and 31 for purposes of this Appeal.

A. The Proposed *Mahapatro-Dietrich- Miller* Combination Fails to Disclose, Teach, or Suggest Various Limitations Recited in Applicants' Claims

First, Appellants respectfully submit that the proposed *Mahapatro-Dietrich-Miller* combination does not support the obviousness rejection of Claims 1-45 because the proposed combination fails to disclose, teach, or suggest various limitations recited in Claims 1-45. The claims are allowable for at least this reason. Appellants discuss independent Claim 1 as an example.

In general, *Mahapatro* is directed to a system for generating a schedule by generating assignments for the tasks of a project and sequentially scheduling the individual assignments to available resources. (Abstract) The system disclosed in *Mahapatro* receives information concerning the resources and the tasks. (Column 5, Lines 15-16) The tasks may be associated with constraints such as an identification of the resources assigned to the task and scheduling constraints (e.g., the date by which the task must be completed). (*See* Abstract and Column 6, Lines 33-40) The information concerning the resources and tasks is used to generate assignments, which can be individually scheduled to a resource, and a resource calendar that identifies available time slots for each resource. (Column 5, Lines 16-20) Next, the assignments are sequentially scheduled into available time slots for the various resources assigned to the project. (Column 5, Lines 20-22) According to *Mahapatro,* the resulting schedule is balanced and maximizes the utilization of the available resources. (Column 5, Lines 22-23)

In contrast, independent Claim 1 recites:

> A method for scheduling development planning for ***a plurality of products of an enterprise***, comprising:
>
> receiving a list of ***a plurality of products*** to be developed;
>
> receiving a list of required completion dates, each completion date specifying the completion date for the development of ***a corresponding product in the plurality of products***;
>
> receiving, ***for each product in the plurality of products***, a project definition of a project for developing the product, each project definition defining:
>
> a plurality of tasks required to complete a project for developing the product associated with the project definition; and
>
> a list of resources required to complete each task defined in the product definition, ***at least one of the plurality of tasks for at least one of the plurality of projects requiring a material to be provided by an outside party distinct from the enterprise***;
>
> receiving a list of available resources, each resource in the list of available resources having a capacity as a function of time;
>
> receiving a list of materials available from outside parties distinct from the enterprise and a schedule of availability of the materials available from the outside parties; and
>
> automatically generating a schedule ***comprising all tasks for all projects***, the schedule ***allocating the resources such that each resource is allocated at a level less than or equal to its capacity***, the schedule also ***scheduling tasks that require materials from outside parties at a time when such materials will be available***.

Mahapatro, whether considered alone or in combination with *Miller* and *Dietrich*, fails to disclose, teach, or suggest various limitations recited in Claim 1.

For example, *Mahapatro* fails to disclose, teach, or suggest "receiving a list of ***a plurality of products*** to be developed," as recited in Claim 1. *Mahapatro* apparently discloses merely generating a schedule for completing tasks of a *single project.* The cited portions of *Mahapatro* do not make any mention of "a plurality of products," as recited in Claim 1. In general, especially given constrained resources, it is more complex to generate a schedule for a plurality of products and tasks as recited in Appellants' Claim 1 than for the *single project* as disclosed in *Mahapatro.* Both *Dietrich* and *Miller* fail to make up for this deficiency of *Mahapatro* and thus the proposed *Mahapatro-Dietrich-Miller* combination is insufficient to support these rejections.

In response to a substantially similar argument made during prosecution, the Examiner stated that the "Examiner does not give this limitation patentable weight." (Final Office Action, Page 2) Appellants respectfully note that to establish a *prima facie* case of obviousness, three basic criteria must be met. One of these requirements is that the prior art reference (or references when combined) *must teach or suggest all the claim limitations.* M.P.E.P. § 2142 (emphasis added); *see also* M.P.E.P. § 2143.03. *"All words in a claim must be considered* in judging the patentability of that claim against the prior art." M.P.E.P. § 2143.03 (emphasis added). Thus, Appellants respectfully submit that the Examiner must give patentable weight to all limitations in Claim 1 relating to the plurality of products. Furthermore, Claim 1 recites "***receiving a list of a plurality of products to be developed***" as an explicit step of the method to which Claim 1 is directed.

The Examiner further stated, "The claims are directed to scheduling development planning for a (singular) product in a group of products." (Final Office Action, Page 2) Appellants respectfully submit that the Examiner apparently mischaracterized Claim 1. In particular, Claim 1 clearly recites a "method of scheduling development planning ***for a plurality of products of an enterprise***." The Examiner further stated, "The fact that the product is part of a group of products does not affect the schedule generation." (Final Office Action, Page 2) Appellants respectfully disagree. As Appellants noted above, in general,

especially given constrained resources, it is more complex to generate a schedule for a plurality of products and tasks as recited in Claim 1 than for the *single project* as disclosed in *Mahapatro.*

The Examiner further stated, "The claims are written in such a way that all of the limitations are directed to gathering information about a single product and generating a schedule then repeating for another single product and compiling all the schedules." (Final Office Action, Page 2) First, Appellants respectfully submit that the Examiner paraphrased and, in some cases, mischaracterized Claim 1. Second, Claim 1 plainly recites, in part:

- receiving a list of ***a plurality of products*** to be developed;
- receiving ***a list of required completion dates, each completion date*** specifying the completion date for the development ***of a corresponding product in the plurality of products***;
- ***receiving, for each product in the plurality of products, a project*** definition of a project for developing the product, ***each project definition*** defining:
  a plurality of tasks required to complete a project for developing the product associated with the project definition; and
  a list of resources required to complete each task defined in the product definition, at least one of the plurality of tasks for at least one of the plurality of projects requiring a material to be provided by an outside party distinct from the enterprise;
- automatically generating a development schedule ***comprising all tasks for all projects***, the development schedule allocating the resources such that each resource is allocated at a level less than or equal to its capacity, the development schedule also scheduling tasks that require materials from outside parties at a time when such materials will be available.

Claim 1 clearly involves scheduling development planning for a plurality of projects (each project for a product in the plurality of products), and the Examiner has explicitly acknowledged that the limitations of Claim 1 relating to the plurality of products were not given patentable weight by the Examiner. Appellants respectfully submit that the Examiner's failure to give patentable weight to all limitations recited in Claim 1 is improper, that the Examiner must consider these limitations, and that *Mahapatro, Dietrich,* and *Miller* all fail to disclose, teach, or suggest the plurality of products or generating a development schedule for all products in the plurality of products.

As another example, *Mahapatro* fails to disclose, teach, or suggest "receiving a list of required completion dates, ***each completion date specifying the completion date for the development of a corresponding product in the plurality of products***," as recited in Claim 1. *Mahapatro* merely discloses receiving a scheduling constraint for each of the tasks of a project, specifying a date by which the task must be completed. (*See* Column 6, Lines 37-40) First, because *Mahapatro* fails to disclose, teach, or suggest "***the plurality of products***" recited in Claim 1 as discussed above, *Mahapatro* necessarily fails to disclose, teach, or suggest "each completion date specifying the completion date for the development of "***a corresponding product in the plurality of products***," as recited in Claim 1. Second, even assuming for the sake of argument that the project in *Mahapatro* could be equated with even a single product in the plurality of products recited in Claim 1, *Mahapatro* would still only teach receiving dates by which *the tasks* of the project must be completed rather than by which the product must be completed as disclosed in Claim 1. (*See* Column 5, Lines 11-24 and Column 6, Lines 33-44) Thus, *Mahapatro* fails to disclose, teach, or suggest "receiving a list of required completion dates, ***each completion date specifying the completion date for the development of a corresponding product in the plurality of products***," as recited in Claim 1. Both *Dietrich* and *Miller* fail to make up for these deficiencies of *Mahapatro* and thus the proposed *Mahapatro-Dietrich-Miller* combination is insufficient to support these rejections.

As another example, *Mahapatro* fails to disclose, teach, or suggest "***receiving, for each product in the plurality of products, a project definition of a project for developing the product***," as recited in Claim 1. Even assuming for the sake of argument only that the *tasks received for the single project* by the system in *Mahapatro* could be equated to the project definition recited in Claim 1, *Mahapatro* would still fail to disclose, teach, or suggest "receiving, ***for each product in the plurality of products***, a project definition of a project for developing the product," as recited in Claim 1. Both *Dietrich* and *Miller* fail to make up for these deficiencies of *Mahapatro* and thus the proposed *Mahapatro-Dietrich-Miller* combination is insufficient to support these rejections.

As another example, *Mahapatro* fails to disclose, teach, or suggest "automatically generating a schedule comprising ***all tasks for all projects***, the schedule ***allocating the***

resources such that each resource is allocated at a level less than or equal to its capacity, the schedule also ***scheduling tasks that require materials from outside parties at a time when such materials will be available***," as recited in Claim 1. In the Final Office Action, the Examiner rejected Claim 1 under 35 U.S.C. § 103(a) as being unpatentable over a proposed combination of three references – *Mahapatro, Dietrich,* and *Miller.* However, in the explanation of the rejection of Claim 1 in the Final Office Action, the Examiner made no mention of *Miller.* In the Non-final Office Action, the Examiner acknowledged that *Mahapatro* does not "teach generating a schedule allocating all resources such that each resource is allocated at a level less than or equal to its capacity." (Non-final Office Action, Page 3) However, the Examiner argued in the Non-final Office Action that *Miller* accounts for the acknowledged deficiencies of *Mahapatro.*

Even though the Final Office Action did not mention the relevance of *Miller* to Claim 1, Appellants will assume for purposes of this Appeal Brief (as Appellants did in the Response to the Final Office Action) that the Examiner had not changed positions regarding the acknowledged deficiencies of *Mahapatro* and the alleged relevance of *Miller.* As Appellants demonstrated in the Response to the Non-final Office Action, *Miller* fails to account for the acknowledged deficiencies of *Mahapatro.* In particular, nowhere does *Miller* disclose, teach, or suggest "automatically generating a schedule comprising ***all tasks for all projects***, the schedule ***allocating the resources such that each resource is allocated at a level less than or equal to its capacity***, the schedule also ***scheduling tasks that require materials from outside parties at a time when such materials will be available***," as recited in Claim 1.

One portion of *Miller* cited by the Examiner in the Non-final Office Action merely states, "The input data provided to the computing system may also include resource requirements for the various tasks as, for example, the number of workers having particular skills or machines of a certain type required to perform each particular task." (Column 1, Lines 46-50) This and another cited portion of *Miller* apparently disclose nothing more than assigning those with certain skills to certain tasks. This certainly does not disclose, teach, or suggest "automatically generating a schedule comprising ***all tasks for all projects,*** **the schedule** ***allocating the resources such that each resource is allocated at a level less than***

or equal to its capacity [the capacity of the resource as a function of time], the schedule also ***scheduling tasks that require materials from outside parties at a time when such materials will be available***," as recited in Claim 1.

As another example, the Examiner acknowledged in the Final Office Action that *Mahapatro* fails to explicitly teach "receiving a list of materials available from outside parties distinct from the enterprise and a schedule of availability of the materials available from the outside parties," as recited in Claim 1. However, the Examiner argued that *Dietrich* does teach this limitation. (*See* Final Office Action, Pages 2 and 4) Whether or not this is true, the above-described deficiencies of both *Mahapatro* and *Miller,* and *Dietrich's* failure to account for those deficiencies, are sufficient to patentably distinguish Claim 1 from the proposed *Mahapatro-Dietrich-Miller* combination. Thus, the proposed *Mahapatro-Dietrich-Miller* combination is insufficient to support these rejections.

B. At Least the Proposed *Mahapatro-Dietrich* Combination is Improper

Second, Appellants respectfully submit that the proposed *Mahapatro-Dietrich-Miller* combination does not support the obviousness rejection of Claims 1-45 because the Examiner has not shown the required teaching, suggestion, or motivation in *Mahapatro, Dietrich,* or in the knowledge generally available to those of ordinary skill in the art at the time of the invention to combine or modify *Mahapatro* or *Dietrich* in the manner the Examiner proposes. The rejected claims are allowable for at least this additional reason.

Appellants respectfully direct the Board's attention to Section II above, which discusses the standard the Examiner must satisfy to prove a *prima facie* case of obviousness under the M.P.E.P. and governing Federal Circuit decisions.

Appellants respectfully submit that the Examiner's conclusory assertion that it would have been obvious to combine the teachings of *Mahapatro* with the teachings of *Dietrich* to arrive at Appellants' invention is entirely insufficient to support a *prima facie* case of obviousness under 35 U.S.C. § 103(a) under the M.P.E.P. and the governing Federal Circuit case law.

With regard to the proposed *Mahapatro-Dietrich* combination, the Examiner stated, "Since both Mahapatro and Dietrich teach a scheduling system wherein products are developed according to the availability of resources, it would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate Dietrich's external availability schedule for materials into Mahapatro's scheduling system to account for all resources available to generate a specific product thereby increasing the efficiency of the scheduling system." (Final Office Action, Page 4) First, Appellants respectfully submit that the Examiner has merely pointed to an alleged advantage of modifying the system disclosed in *Mahapatro* with the system disclosed in *Dietrich,* which is not found in the prior art and is clearly insufficient to provide the requisite teaching, suggestion, or motivation for combining these references under the M.P.E.P. and the governing Federal Circuit case law. Second, Appellants respectfully submit that this alleged advantage would not even be achieved by combining these references in the manner the Examiner proposes. In particular, Appellants respectfully disagree with the Examiner's assertion that "incorporat[ing] Dietrich's external availability schedule for materials into Mahapatro's scheduling system to account for all resources available to generate a specific product thereby increasing the efficiency of the scheduling system." On the contrary, accounting for external resources in a scheduling system would likely increase the computational complexity of the scheduling system, making the scheduling system less efficient. While it may be true that the resulting schedule from a scheduling system that accounts for resources external to an enterprise would be more complete, the Examiner is simply using Appellants' invention as a blueprint for piecing together these references.

The Examiner has not pointed to any portions of either *Mahapatro* or *Dietrich* that would teach, suggest, or motivate one of ordinary skill in the art at the time of invention to incorporate the particular resource allocation methods disclosed in *Mahapatro* with the particular allocation method for generating a production schedule disclosed in *Dietrich*. This is clearly inconsistent with the M.P.E.P and controlling Federal Circuit case law, which requires a showing of a specific teaching, suggestion, motivation for combining or modifying the references in the references themselves or in the knowledge generally available to one of ordinary skill in the art at the time of invention.

Appellants respectfully note that "the factual inquiry whether to combine references must be thorough and searching." *McGinley v. Franklin Sports, Inc.*, 262 F.3d 1339, 1351-52, 60 U.S.P.Q.2d 1001, 1008 (Fed. Cir. 2001) Thus, the burden is on the examiner to identify concrete evidence in the record to support his conclusion that it would have been obvious to modify the teachings of the cited references to achieve the claimed invention. *See, In re Kotzab,* 217 F.3d 1365, 1370, 55 U.S.P.Q.2d 1313, 1316-17 (Fed. Cir. 2000) The Examiner's conclusory assertion that it would have been obvious to combine *Mahapatro* with *Dietrich* fails to provide a thorough and searching factual inquiry and does not identify any concrete evidence in the record for combining these references.

C. Conclusion with Respect to Group 1

Accordingly, since the proposed *Mahapatro-Dietrich-Miller* combination fails to disclose, teach, or suggest each and every limitation recited in Claim 1 and since the references fail to provide the required teaching, suggestion, or motivation to combine *Mahapatro* with *Dietrich* in the manner the Examiner proposes, Appellants respectfully submit that the Examiner's conclusions set forth in the Final Office Action fall well short of the requirements set forth in the M.P.E.P. and the governing Federal Circuit case law for demonstrating a *prima facie* case of obviousness. Thus, Appellants respectfully submit that the Examiner's proposed combination of *Mahapatro* with *Dietrich* appears to be merely an attempt, with the benefit of hindsight, to reconstruct Appellants' claims and is unsupported by the teachings of *Mahapatro* and *Dietrich.* Appellants respectfully submit that the rejection must therefore be withdrawn.

Furthermore, as demonstrated above, Appellants respectfully submit that *Mahapatro* (as well as *Miller,* for that matter) is wholly inadequate as a reference against independent Claim 1. Thus, even if *Dietrich* discloses the portions of Claim 1 that the Examiner suggests, and even assuming for the sake of argument that there was the required teaching, suggestion, or motivation to combine *Mahapatro* with *Dietrich* as the Examiner proposes, the proposed *Mahapatro-Miller-Dietrich* combination would still fail to disclose, teach, or suggest the limitations specifically recited in independent Claim 1, as is required under the M.P.E.P. and the governing Federal Circuit cases for a *prima facie* case of obviousness.

For at least these reasons, the proposed *Mahapatro-Dietrich-Miller* combination fails support the obviousness rejection of independent Claim 1 and its dependent claims. For analogous reasons, the proposed *Mahapatro-Dietrich-Miller* combination fails to support the obviousness rejections of independent Claims 3 and 31 and their dependent claims. These claims are therefore patentable over the proposed *Mahapatro-Dietrich-Miller* combination. Appellants respectfully submit that these rejections are improper and should be reversed by the Board.

VII. Group 2 (Claims 8, 21, and 36)

Claims 8, 21, and 36 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over the proposed *Mahapatro-Dietrich-Miller* combination. Appellants respectfully submit that these claims are clearly patentable over the proposed *Mahapatro-Dietrich-Miller* combination. Thus, Appellants respectfully submit that these rejections are improper and should be reversed by the Board.

Claims 8, 21, and 36 are separately patentable from every other claim subject to the same ground of rejection. These claims recite limitations that are substantially different from limitations recited in the claims of other groups and cannot be properly grouped with the claims of other groups for purposes of this Appeal. For example, these claims recite patentable distinctions over the prior art beyond those recited in independent Claims 1, 3, and 31, and patentable distinctions over the prior art different from those recited in other dependent claims.

Dependent Claims 8, 21, and 36 depend from independent Claims 1, 3, and 31, respectively, which Appellants have shown above to be clearly patentable over the proposed *Mahapatro-Dietrich-Miller* combination, and are allowable for at least this reason. Furthermore, in addition to those reasons discussed above with reference to independent Claims 1, 3, and 31, dependent Claims 8, 21, and 36 recite further patentable distinctions over the proposed *Mahapatro-Dietrich-Miller* combination.

For example, dependent Claim 8 recites:

> The method of Claim 1, wherein a particular task comprises a plurality of subtasks, a task definition for the particular task specifying the plurality of subtasks and an order in which the plurality of subtasks should be performed.

Dependent Claims 21 and 36 recite analogous limitations.

The Examiner argues that *Mahapatro* discloses these limitations at tables 1 and 2, appearing in Columns 13 and 14, respectively. (*See* Final Office Action, Pages 5-6) In particular, the Examiner states tables 1 and 2 of *Mahapatro* show "a hierarchy of tasks and resources listed out." Each assignment in table 3 identifies a resource [and] a parent task. Table 2 shows [an] order wherein task 2 must be started after task 1." (Final Office Action, Page 6) In fact, each of tables 1 and 2 of *Mahapatro* merely show three separate tasks – tasks 1, 2, and 3. While these tasks may require more than one resource (*see* tables 2 and 3) and may be ordered (*see* table 3), nowhere do tables 1 and 2 or their associated text disclose, teach, or suggest "***a particular task [in the plurality of tasks of a project definition of a project for developing a product] compris[ing] a plurality of subtasks, a task definition for the particular task specifying the plurality of subtasks and an order in which the plurality of subtasks should be performed***," as recited in Claim 8. For example, task 1 in tables 1 and 2 of *Mahapatro* simply does not comprise any subtasks for completing task 1.

Dietrich and *Miller* fail to make up for these deficiencies of *Mahapatro*.

For at least these reasons, the proposed *Mahapatro-Dietrich-Miller* combination fails support the obviousness rejection of dependent Claim 8. For analogous reasons, the proposed *Mahapatro-Dietrich-Miller* combination fails to support the obviousness rejections of dependent Claims 21 and 36. These claims are therefore patentable over the proposed *Mahapatro-Dietrich-Miller* combination. Appellants respectfully submit that these rejections are improper and should be reversed by the Board.

VIII. Group 3 (Claims 9, 22, and 37)

Claims 9, 22, and 37 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over the proposed *Mahapatro-Dietrich-Miller* combination. Appellants respectfully submit that these claims are clearly patentable over the proposed *Mahapatro-Dietrich-Miller*

combination. Thus, Appellants respectfully submit that these rejections are improper and should be reversed by the Board.

Claims 9, 22, and 37 are separately patentable from every other claim subject to the same ground of rejection. These claims recite limitations that are substantially different from limitations recited in the claims of other groups and cannot be properly grouped with the claims of other groups for purposes of this Appeal. For example, these claims recite patentable distinctions over the prior art beyond those recited in independent Claims 1, 3, and 31, and patentable distinctions over the prior art different from those recited in other dependent claims.

Dependent Claims 9, 22, and 37 depend from independent Claims 1, 3, and 31, respectively, which Appellants have shown above to be clearly patentable over the proposed *Mahapatro-Dietrich-Miller* combination, and are allowable for at least this reason. Furthermore, in addition to those reasons discussed above with reference to independent Claims 1, 3, and 31, dependent Claims 9, 22, and 37 recite further patentable distinctions over the proposed *Mahapatro-Dietrich-Miller* combination.

For example, dependent Claim 9 recites:

> The method of Claim 1, wherein the plurality of tasks are defined in a hierarchy specifying relationships among related tasks, at least one task comprising a plurality of sub-tasks, each leaf tasks being associated with an identification of one or more resources for performing the leaf task.

Dependent Claims 22 and 37 recite analogous limitations.

The Examiner again argues that *Mahapatro* discloses these limitations at tables 1 and 2, making the same arguments as made with respect to Claim 8. (*See* Final Office Action, Page 6) Appellants reiterate that each of tables 1 and 2 of *Mahapatro* merely show three separate tasks – tasks 1, 2, and 3. While these tasks may require more than one resource (*see* tables 2 and 3) and may be ordered (*see* table 3), nowhere do tables 1 and 2 or their associated text disclose, teach, or suggest that "the plurality of tasks [in the project definition of a project for developing a product] are defined in ***a hierarchy specifying relationships***

among related tasks, at least one task comprising a plurality of sub-tasks, each leaf tasks being associated with an identification of one or more resources for performing the leaf task," as recited in Claim 9. For example, task 1 in tables 1 and 2 of *Mahapatro* simply does not comprise any subtasks for completing task 1. At best, *Mahapatro* discloses the order in which certain tasks should be performed.

Dietrich and *Miller* fail to make up for these deficiencies of *Mahapatro*.

For at least these reasons, the proposed *Mahapatro-Dietrich-Miller* combination fails support the obviousness rejection of dependent Claims 9. For analogous reasons, the proposed *Mahapatro-Dietrich-Miller* combination fails to support the obviousness rejections of dependent Claims 22 and 37. These claims are therefore patentable over the proposed *Mahapatro-Dietrich-Miller* combination. Appellants respectfully submit that these rejections are improper and should be reversed by the Board.

IX. Group 4 (Claims 10, 23, and 38)

Claims 10, 23, and 38 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over the proposed *Mahapatro-Dietrich-Miller* combination. Appellants respectfully submit that these claims are clearly patentable over the proposed *Mahapatro-Dietrich-Miller* combination. Thus, Appellants respectfully submit that these rejections are improper and should be reversed by the Board.

Claims 10, 23, and 38 are separately patentable from every other claim subject to the same ground of rejection. These claims recite limitations that are substantially different from limitations recited in the claims of other groups and cannot be properly grouped with the claims of other groups for purposes of this Appeal. For example, these claims recite patentable distinctions over the prior art beyond those recited in independent Claims 1, 3, and 31, and patentable distinctions over the prior art different from those recited in other dependent claims.

Dependent Claims 10, 23, and 38 depend from independent Claims 1, 3, and 31, respectively, which Appellants have shown above to be clearly patentable over the proposed

Mahapatro-Dietrich-Miller combination, and are allowable for at least this reason. Furthermore, in addition to those reasons discussed above with reference to independent Claims 1, 3, and 31, dependent Claims 10, 23, and 38 recite further patentable distinctions over the proposed *Mahapatro-Dietrich-Miller* combination.

For example, dependent Claim 10 recites:

> The method of Claim 1, wherein a particular task in the plurality of tasks comprises a standard tasks for repeated use, the method further comprising storing a task definition for the particular task comprising a list of sub-tasks for performing the particular task and a list of resources for performing the sub-tasks in the list of sub-tasks.

Dependent Claims 23 and 38 recite analogous limitations.

At the outset, Appellants note that the Examiner does not indicate any basis for the rejection of these claims, but instead merely indicates that these limitations are taught, without even identifying which reference teaches these limitations. (*See* Final Office Action, Page 6) In any event, neither of *Mahapatro*, *Dietrich*, nor *Miller* disclose, teach, or suggest the concept of a standard task for repeated use. For example, Appellants' Specification defines a standard task in at least the following excerpt:

> Each leaf subtask on the task hierarchy tree, subtasks 150, 152, 146, and 148 in Figure 10, has associated with it one or more resources. The resources needed for task 140 is the sum of all resources needed for its subtasks. Because standard tasks may comprise a fairly complex set of subtasks, they may be pre-stored as templates to be used whenever the task is required. This simplifies the planning and scheduling process, because the details of each task are generated carefully once, and reused many times. The high level time and resources required for a task are used by the portfolio planner; the details contained in the subtasks are used by the detailed scheduler.

(Page 18, Lines 9-17)

In contrast, it appears that the tasks defined in *Mahapatro*, for example, are specific to the particular single project with which they are associated. There does not appear to be any indication otherwise in *Mahapatro*. Thus, *Mahapatro* fails to disclose, teach, or suggest "***a particular task in the plurality of tasks comprises a standard tasks for repeated use, the***

method further comprising storing a task definition for the particular task comprising a list of sub-tasks for performing the particular task and a list of resources for performing the sub-tasks in the list of sub-tasks," as recited in Claim 10.

Dietrich and *Miller* fail to make up for these deficiencies of *Mahapatro*.

For at least these reasons, the proposed *Mahapatro-Dietrich-Miller* combination fails support the obviousness rejection of dependent Claim 10. For analogous reasons, the proposed *Mahapatro-Dietrich-Miller* combination fails to support the obviousness rejections of dependent Claims 23 and 38. These claims are therefore patentable over the proposed *Mahapatro-Dietrich-Miller* combination. Appellants respectfully submit that these rejections are improper and should be reversed by the Board.

X. Group 5 (Claims 13, 26, and 41)

Claims 13, 26, and 41 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over the proposed *Mahapatro-Dietrich-Miller* combination. Appellants respectfully submit that these claims are clearly patentable over the proposed *Mahapatro-Dietrich-Miller* combination. Thus, Appellants respectfully submit that these rejections are improper and should be reversed by the Board.

Claims 13, 26, and 41 are separately patentable from every other claim subject to the same ground of rejection. These claims recite limitations that are substantially different from limitations recited in the claims of other groups and cannot be properly grouped with the claims of other groups for purposes of this Appeal. For example, these claims recite patentable distinctions over the prior art beyond those recited in independent Claims 1, 3, and 31, and patentable distinctions over the prior art different from those recited in other dependent claims.

Dependent Claims 13, 26, and 41 depend from independent Claims 1, 3, and 31, respectively, which Appellants have shown above to be clearly patentable over the proposed *Mahapatro-Dietrich-Miller* combination, and are allowable for at least this reason. Furthermore, in addition to those reasons discussed above with reference to independent

Claims 1, 3, and 31, dependent Claims 13, 26, and 41 recite further patentable distinctions over the proposed *Mahapatro-Dietrich-Miller* combination.

For example, dependent Claim 13 recites:

> The method of Claim 1, wherein the list of available resources is defined in a hierarchy specifying relationships among related resources, at least one resource comprising a plurality of sub-resources.

Dependent Claims 26 and 41 recite analogous limitations.

The Examiner relied on the following excerpt from *Mahapatro* as disclosing the limitations of these claims:

> The resources can include humans, specimens, equipment, office space or any other item that is required to perform the task. The only requirements imposed on the resource information are that each resource must be identified, and each time period in which the resource is available for scheduling must be provided. Optionally, other information may be provided to further describe the resource, such as the efficiency of the resource, special expertise, preferred work types, preferred work times, resource priorities, and other such information. This additional information can easily be incorporated into the preferred program and the preferred program is not limited to any specific set of information concerning the resources.

(Column 12, Lines 1-12)

With respect to this excerpt, the Examiner stated that "resources have priorities wherein one resource would be ranked above another resource thereby setting up a hierarchy of resources." (Final Office Action, Page 7) First, Appellants do not necessarily agree that merely having priorities necessarily establishes a hierarchy of the resources, as asserted by the Examiner. For example, Appellants' Specification describes defining resources in a hierarchy in the following excerpt:

> In a similar manner, resources are preferably defined in a hierarchy, as illustrated in Figure 11. In this example, resource A 160 is comprised of three separate sub-resources 162, 164, and 166. Resources 162 are further broken into a lower level of resources, with resources 168 and 170 making resource 162. the details of resource 164 are omitted for simplicity in explanation.
>
> The resource hierarchies are defined to match resources as they are actually applied within the company. At the lowest sub-level, a resource could

> comprise a single person, or a group that works as a unit. For example, resource 160 could be defined as the testing department, with resource 162 being the user interface group, and resources 168 and 170 being testing teams or individuals. The lowest levels of subtasks 150, 152 will generally require resources at the lowest, detailed levels.

(Page 18, Line 18 through Page 19, Line 7; *see also* FIGURE 11)

Even more clearly, *Mahapatro* fails to disclose, teach, or suggest "at least one resource comprising a plurality of sub-resources," as recited in Claim 13. The fact that resources may be associated with priorities simply fails to disclose, teach, or suggest "at least one resource comprising a plurality of sub-resources," as recited in Claim 13.

Dietrich and *Miller* fail to account for these deficiencies of *Mahapatro*.

For at least these reasons, the proposed *Mahapatro-Dietrich-Miller* combination fails support the obviousness rejection of dependent Claim 13. For analogous reasons, the proposed *Mahapatro-Dietrich-Miller* combination fails to support the obviousness rejections of dependent Claims 26 and 41. These claims are therefore patentable over the proposed *Mahapatro-Dietrich-Miller* combination. Appellants respectfully submit that these rejections are improper and should be reversed by the Board.

XI. Group 6 (Claims 14, 27, and 42)

Claims 14, 27, and 42 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over the proposed *Mahapatro-Dietrich-Miller* combination. Appellants respectfully submit that these claims are clearly patentable over the proposed *Mahapatro-Dietrich-Miller* combination. Thus, Appellants respectfully submit that these rejections are improper and should be reversed by the Board.

Claims 14, 27, and 42 are separately patentable from every other claim subject to the same ground of rejection. These claims recite limitations that are substantially different from limitations recited in the claims of other groups and cannot be properly grouped with the claims of other groups for purposes of this Appeal. For example, these claims recite patentable distinctions over the prior art beyond those recited in independent Claims 1, 3, and

31, and patentable distinctions over the prior art different from those recited in other dependent claims.

Dependent Claims 14, 27, and 42 depend from independent Claims 1, 3, and 31, respectively, which Appellants have shown above to be clearly patentable over the proposed *Mahapatro-Dietrich-Miller* combination, and are allowable for at least this reason. Furthermore, in addition to those reasons discussed above with reference to independent Claims 1, 3, and 31, dependent Claims 14, 27, and 42 recite further patentable distinctions over the proposed *Mahapatro-Dietrich-Miller* combination.

For example, dependent Claim 14 recites:

> The method of Claim 1, further comprising:
> receiving project status information from a user, the project status information regarding the status of a project in the plurality of projects; and
> automatically modifying the development schedule based on the project status information.

Dependent Claims 27 and 42 recite analogous limitations.

As disclosing these limitations, the Examiner cites a first portion of *Mahapatro*, which discloses that the schedule for a project can be displayed and that the project manager for the project can review the schedule to determine project status. (*See* Final Office Action, Pages 7-8 and Column 18, Lines 57-67) The Examiner also cites a second portion of *Mahapatro*, which discloses that "the preferred program allows the input of additional information or the modification of previously entered data. Upon the entry of additional or modified information, processing returns to Process 2 in order to regenerate the schedule based on the new information." (*See* Final Office Action, Page 8 and Column 19, Lines 1-15)

At a minimum, these disclosures of *Mahapatro* fail to disclose, teach, or suggest "automatically modifying the development schedule based on the project status information," as recited in Claim 14. The development schedule recited in Claim 14 refers to the automatically-generated development schedule recited in Claim 1, that development schedule comprising all tasks for all projects. Thus, the automatically-modified development schedule recited in Claim 14 that is generated based on received project status information comprises

all tasks for all projects. Any modified schedule disclosed, taught, or suggested in *Mahapatro* is specific to a single project.

Dietrich and *Miller* fail to account for this deficiency of *Mahapatro*.

For at least these reasons, the proposed *Mahapatro-Dietrich-Miller* combination fails support the obviousness rejection of dependent Claim 14. For analogous reasons, the proposed *Mahapatro-Dietrich-Miller* combination fails to support the obviousness rejections of dependent Claims 27 and 42. These claims are therefore patentable over the proposed *Mahapatro-Dietrich-Miller* combination. Appellants respectfully submit that these rejections are improper and should be reversed by the Board.

Conclusion

Appellants have demonstrated that the present invention, as claimed, is clearly patentably distinguishable over the prior art cited by the Examiner. Therefore, Appellants respectfully request the Board of Patent Appeals and Interferences to reverse the final rejection of the Examiner and instruct the Examiner to issue a Notice of Allowance of all pending claims.

Appellants have enclosed a check in the amount of $500.00 for this Appeal Brief. Although Appellants believe no other fees are due, the Commissioner is hereby authorized to charge any additional fees and credit any overpayments to Deposit Account No. 02-0384 of Baker Botts L.L.P.

Respectfully submitted,

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Customer Number: **05073**

Appendix A

1. (Previously Presented) A method for scheduling development planning for a plurality of products of an enterprise, comprising:

receiving a list of a plurality of products to be developed;

receiving a list of required completion dates, each completion date specifying the completion date for the development of a corresponding product in the plurality of products;

receiving, for each product in the plurality of products, a project definition of a project for developing the product, each project definition defining:

a plurality of tasks required to complete a project for developing the product associated with the project definition; and

a list of resources required to complete each task defined in the product definition, at least one of the plurality of tasks for at least one of the plurality of projects requiring a material to be provided by an outside party distinct from the enterprise;

receiving a list of available resources, each resource in the list of available resources having a capacity as a function of time;

receiving a list of materials available from outside parties distinct from the enterprise and a schedule of availability of the materials available from the outside parties; and

automatically generating a development schedule comprising all tasks for all projects, the development schedule allocating the resources such that each resource is allocated at a level less than or equal to its capacity, the development schedule also scheduling tasks that require materials from outside parties at a time when such materials will be available.

2. (Previously Presented) The method of Claim 1, wherein:

each available resource is assigned an ability level;

each task requiring a resource specifies a minimum ability level of one or more resources to be used for that task; and

the generated development schedule allocates, to all tasks, resources that have an ability level at least as high as the specified minimum ability level.

3. (Previously Presented) A system for scheduling development planning for a plurality of products of an enterprise, comprising:

a list of a plurality of products to be developed;

a list of required completion dates, each completion date specifying the completion date for the development of a corresponding product in the plurality of products;

for each product in the plurality of products, a project definition of a project for developing the product, each project definition defining:

a plurality of tasks required to complete a project for developing the product associated with the project definition; and

a list of resources required to complete each task defined in the product definition, at least one of the plurality of tasks for at least one of the plurality of projects requiring a material to be provided by an outside party distinct from the enterprise;

a list of available resources, each resource in the list of available resources having a capacity as a function of time;

a list of materials available from outside parties distinct from the enterprise and a schedule of availability of the materials available from the outside parties; and

a scheduler operable to automatically generate a development schedule comprising all tasks for all projects, the development schedule allocating the resources such that each resource is allocated at a level less than or equal to its capacity, the development schedule also scheduling tasks that require materials from outside parties at a time when such materials will be available.

4. (Previously Presented) The system of Claim 3, wherein:

each available resource is assigned an ability level;

each task requiring a resource specifies a minimum ability level of one or more resources to be used for that task; and

the generated development schedule allocates, to all tasks, resources that have an ability level at least as high as the specified minimum ability level.

5. (Previously Presented) The method of Claim 1, wherein each task is associated with a task definition comprising at least one of:

type information identifying the type of task;

hierarchy relationship information comprising one or more pointers to one or more related tasks and information regarding a sequence for performing related tasks;

duration information specifying a quantity of time the task will take to complete;

resource information specifying one or more resources to be used and a desired ability; and

progress information specifying progress of the particular task.

6. (Previously Presented) The method of Claim 5, wherein the task definition further comprises scheduling requirements comprising one or more of:

one or more constraints associated with the particular task; and

policy information specifying one or more rules for enforcing the one or more constraints.

7. (Previously Presented) The method of Claim 6, wherein the one or more constraints comprise:

one or more built-in constraints provided by the scheduler; and

one or more user-specified constraints.

8. (Previously Presented) The method of Claim 1, wherein a particular task comprises a plurality of subtasks, a task definition for the particular task specifying the plurality of subtasks and an order in which the plurality of subtasks should be performed.

9. (Previously Presented) The method of Claim 1, wherein the plurality of tasks are defined in a hierarchy specifying relationships among related tasks, at least one task comprising a plurality of sub-tasks, each leaf tasks being associated with an identification of one or more resources for performing the leaf task.

10. (Previously Presented) The method of Claim 1, wherein a particular task in the plurality of tasks comprises a standard tasks for repeated use, the method further comprising storing a task definition for the particular task comprising a list of sub-tasks for performing the particular task and a list of resources for performing the sub-tasks in the list of sub-tasks.

11. (Previously Presented) The method of Claim 1, further comprising:

monitoring the materials identified in the list of materials from outside parties distinct from the enterprise using one or more supply chain tools operable to monitor the outside parties; and

if one or more materials are determined to be unavailable using the one or more supply chain tools, automatically modifying the development schedule based on information obtained by the one or more supply chain tools.

12. (Previously Presented) The method of Claim 1, wherein each available resource in the list of available resources is associated with a resource definition comprising:

the capacity of the resource;

availability of the resource; and

ability of the resource comprising attribute information identifying a type of work associated with the resource and competency information indicating how well the resource performs the type of work identified in the attribute information.

13. (Previously Presented) The method of Claim 1, wherein the list of available resources is defined in a hierarchy specifying relationships among related resources, at least one resource comprising a plurality of sub-resources.

14. (Previously Presented) The method of Claim 1, further comprising:

receiving project status information from a user, the project status information regarding the status of a project in the plurality of projects; and

automatically modifying the development schedule based on the project status information.

15. (Previously Presented) The method of Claim 1, further comprising:

receiving resource status information from a user, the resource status information regarding the status of available resources in the list of available resources; and

automatically modifying the development schedule based on the resource status information.

16. (Previously Presented) The method of Claim 15, wherein the resource status information comprises a change in the capacity of a resource.

17. (Previously Presented) The method of Claim 1, comprising automatically generating the development schedule using a genetic algorithm.

18. (Previously Presented) The system of Claim 3, wherein each task is associated with a task definition comprising at least one of:

type information identifying the type of task;

hierarchy relationship information comprising one or more pointers to one or more related tasks and information regarding a sequence for performing related tasks;

duration information specifying a quantity of time the task will take to complete;

resource information specifying one or more resources to be used and a desired ability; and

progress information specifying progress of the particular task.

19. (Previously Presented) The system of Claim 18, wherein the task definition further comprises scheduling requirements comprising one or more of:

one or more constraints associated with the particular task; and

policy information specifying one or more rules for enforcing the one or more constraints.

20. (Previously Presented) The system of Claim 19, wherein the one or more constraints comprise:

one or more built-in constraints provided by the scheduler; and

one or more user-specified constraints.

21. (Previously Presented) The system of Claim 3, wherein a particular task comprises a plurality of subtasks, a task definition for the particular task specifying the plurality of subtasks and an order in which the plurality of subtasks should be performed.

22. (Previously Presented) The system of Claim 3, wherein the plurality of tasks are defined in a hierarchy specifying relationships among related tasks, at least one task comprising a plurality of sub-tasks, each leaf tasks being associated with an identification of one or more resources for performing the leaf task.

23. (Previously Presented) The system of Claim 3, wherein a particular task in the plurality of tasks comprises a standard tasks for repeated use, the system further operable to store a task definition for the particular task comprising a list of sub-tasks for performing the particular task and a list of resources for performing the sub-tasks in the list of sub-tasks.

24. (Previously Presented) The system of Claim 3, wherein the scheduler is further operable to:

monitor the materials identified in the list of materials from outside parties distinct from the enterprise using one or more supply chain tools operable to monitor the outside parties; and

if one or more materials are determined to be unavailable using the one or more supply chain tools, automatically modify the development schedule based on information obtained by the one or more supply chain tools.

25. (Previously Presented) The system of Claim 3, wherein each available resource in the list of available resources is associated with a resource definition comprising:

the capacity of the resource;

availability of the resource; and

ability of the resource comprising attribute information identifying a type of work associated with the resource and competency information indicating how well the resource performs the type of work identified in the attribute information.

26. (Previously Presented) The system of Claim 3, wherein the list of available resources is defined in a hierarchy specifying relationships among related resources, at least one resource comprising a plurality of sub-resources.

27. (Previously Presented) The system of Claim 3, wherein the scheduler is further operable to:

receive project status information from a user, the project status information regarding the status of a project in the plurality of projects; and

automatically modify the development schedule based on the project status information.

28. (Previously Presented) The system of Claim 3, wherein the scheduler is further operable to:

receive resource status information from a user, the resource status information regarding the status of available resources in the list of available resources; and

automatically modify the development schedule based on the resource status information.

29. (Previously Presented) The system of Claim 28, wherein the resource status information comprises a change in the capacity of a resource.

30. (Previously Presented) The system of Claim 3, wherein the scheduler is operable to automatically generate the development schedule using a genetic algorithm.

31. (Previously Presented) Software for scheduling development planning for a plurality of products of an enterprise, the software being embodied in computer-readable media and when executed operable to:

receive a list of a plurality of products to be developed;

receive a list of required completion dates, each completion date specifying the completion date for the development of a corresponding product in the plurality of products;

receive, for each product in the plurality of products, a project definition of a project for developing the product, each project definition defining:

a plurality of tasks required to complete a project for developing the product associated with the project definition; and

a list of resources required to complete each task defined in the product definition, at least one of the plurality of tasks for at least one of the plurality of projects requiring a material to be provided by an outside party distinct from the enterprise;

receive a list of available resources, each resource in the list of available resources having a capacity as a function of time;

receive a list of materials available from outside parties distinct from the enterprise and a schedule of availability of the materials available from the outside parties; and

automatically generate a development schedule comprising all tasks for all projects, the development schedule allocating the resources such that each resource is allocated at a level less than or equal to its capacity, the development schedule also scheduling tasks that require materials from outside parties at a time when such materials will be available.

32. (Previously Presented) The software of Claim 31, wherein:

each available resource is assigned an ability level;

each task requiring a resource specifies a minimum ability level of one or more resources to be used for that task; and

the generated development schedule allocates, to all tasks, resources that have an ability level at least as high as the specified minimum ability level.

33. (Previously Presented) The software of Claim 31, wherein each task is associated with a task definition comprising at least one of:

type information identifying the type of task;

hierarchy relationship information comprising one or more pointers to one or more related tasks and information regarding a sequence *for* performing related tasks;

duration information specifying a quantity of time the task will take to complete;

resource information specifying one or more resources to be used and a desired ability; and

progress information specifying progress of the particular task.

34. (Previously Presented) The software of Claim 33, wherein the task definition further comprises scheduling requirements comprising one or more of:

one or more constraints associated with the particular task; and

policy information specifying one or more rules *for* enforcing the one or more constraints.

35. (Previously Presented) The software of Claim 34, wherein the one or more constraints comprise:

one or more built-in constraints provided by the scheduler; and

one or more user-specified constraints.

36. (Previously Presented) The software of Claim 31, wherein a particular task comprises a plurality of subtasks, a task definition for the particular task specifying the plurality of subtasks and an order in which the plurality of subtasks should be performed.

37. (Previously Presented) The software of Claim 31, wherein the plurality of tasks are defined in a hierarchy specifying relationships among related tasks, at least one task comprising a plurality of sub-tasks, each leaf tasks being associated with an identification of one or more resources *for* performing the leaf task.

38. (Previously Presented) The software of Claim 31, wherein a particular task in the plurality of tasks comprises a standard tasks for repeated use, the software further operable to store a task definition for the particular task comprising a list of sub-tasks for performing the particular task and a list of resources for performing the sub-tasks in the list of sub-tasks.

39. (Previously Presented) The software of Claim 31, further operable to:

monitor the materials identified in the list of materials from outside parties distinct from the enterprise using one or more supply chain tools operable to monitor the outside parties; and

if one or more materials are determined to be unavailable using the one or more supply chain tools, automatically modify the development schedule based on information obtained by the one or more supply chain tools.

40. (Previously Presented) The software of Claim 31, wherein each available resource in the list of available resources is associated with a resource definition comprising:

the capacity of the resource;

availability of the resource; and

ability of the resource comprising attribute information identifying a type of work associated with the resource and competency information indicating how well the resource performs the type of work identified in the attribute information.

41. (Previously Presented) The software of Claim 31, wherein the list of available resources is defined in a hierarchy specifying relationships among related resources, at least one resource comprising a plurality of sub-resources.

42. (Previously Presented) The software of Claim 31, further operable to:

receive project status information from a user, the project status information regarding the status of a project in the plurality of projects; and

automatically modify the development schedule based on the project status information.

43. (Previously Presented) The software of Claim 31, further operable to:

receive resource status information from a user, the resource status information regarding the status of available resources in the list of available resources; and

automatically modify the development schedule based on the resource status information.

44. (Previously Presented) The software of Claim 43, wherein the resource status information comprises a change in the capacity of a resource.

45. (Previously Presented) The software of Claim 31, operable to automatically generate the development schedule using a genetic algorithm.